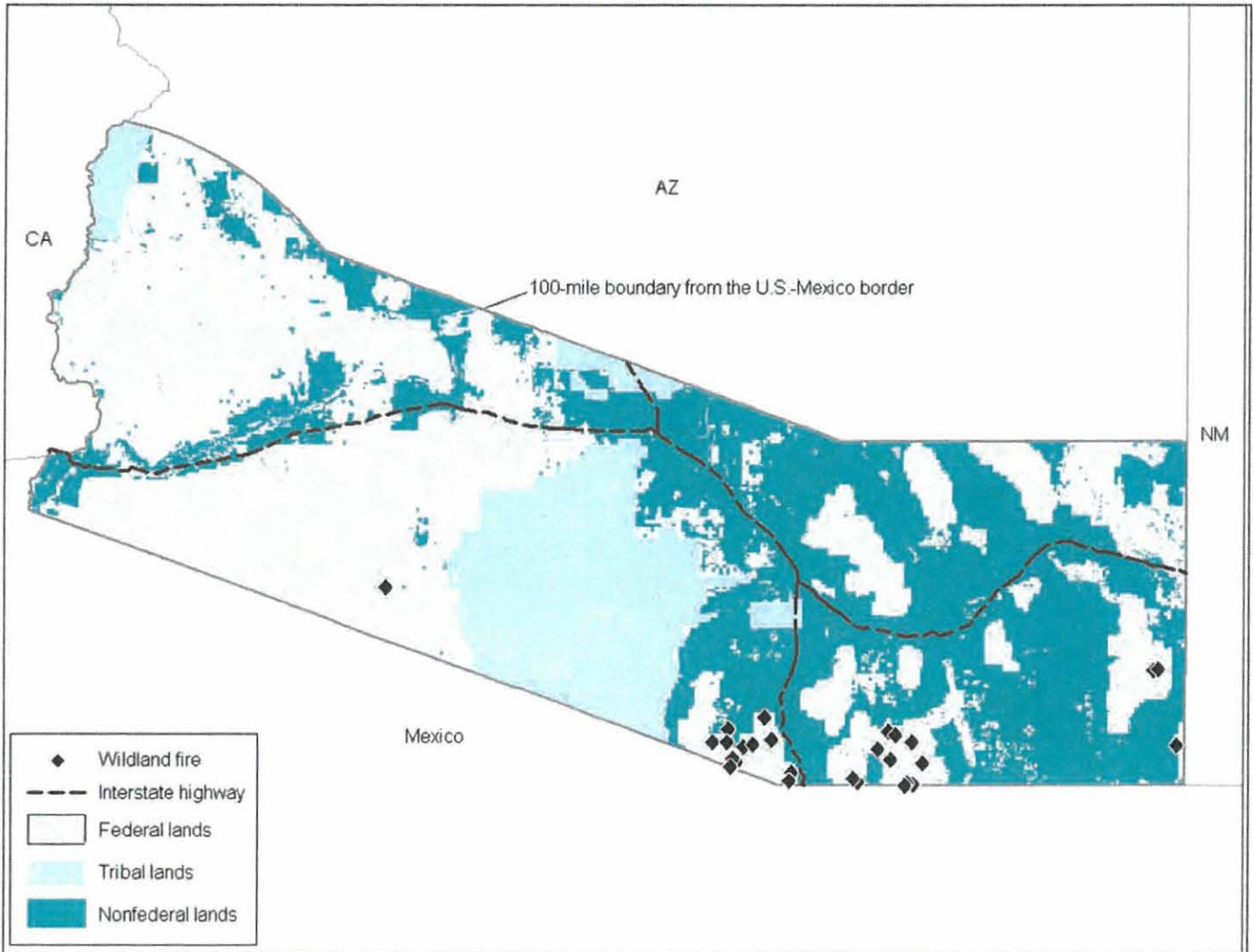


Figure 4: Wildland Fires on Federal Lands for Which Agency Investigation Reports Identified Illegal Border Crossers as a Suspected Ignition Source



Source: GAO analysis of USDA's Forest Service and Interior agencies' fire investigation reports; MapInfo (map).

Investigation reports identified illegal border crossers as a suspected cause of 15 wildland fires that resulted from efforts to signal for help, provide warmth, or cook food. For example, the investigation report for the 2006 Black Mesa Fire, which burned about 170 acres, states that the wildland fire was ignited because a border crosser was injured and needed assistance. According to the report, a group of about 20 individuals crossed

illegally into the United States and, during the trip, one person was injured and could not continue. The group continued without the injured person, but first started a fire to keep animals away and to attract attention in the hope that someone would rescue the injured person. In another instance—the 2009 Bear Fire, which burned 15 acres—the investigation report states that a campfire was the probable cause, noting several indicators regarding a potential source of ignition: (1) discarded bottles and food wrappers with Spanish language labels were found in the area of origin; (2) the area is frequented by illegal border crossers and is adjacent to a heavily used smuggling trail; and (3) the fire was ignited at a time when illegal border crossers are often known to travel.

The investigation reports for the remaining 15 wildland fires suspected to be ignited by illegal border crossers did not explicitly indicate a purpose for the ignition, though a couple of investigation reports for these fires noted that the area of ignition is known for drug smuggling. For instance, the investigation report for the 2010 Horseshoe Fire, which burned about 3,400 acres, stated that evidence found during the investigation suggests that drug smugglers were in the area of ignition.³³

For the other investigated human-caused wildland fires that were not linked to illegal border crossers, federal agency investigation reports identified a number of other potential human causes that could have caused the ignition, and in some cases the investigation reports did not identify any specific cause. Examples from investigation reports include the following:

- Resident campfires were a suspected source of 13 wildland fires, including the 2009 Carr Link Fire, where a visitor to the Coronado National Forest was suspected of leaving a campsite for a day hike without properly extinguishing the campfire.
- Other activities such as recreational shooting, welding accidents, sparks from all-terrain vehicles, and fireworks were a suspected source of 25 fires, such as the 2009 Mile Post 6 Fire on the Coronado

³³The 2011 Horseshoe Two Fire was not included as part of our analysis and is not reflected in our overall number of fires suspected to be caused by illegal border crossers. However, the investigation report for the fire was completed in June 2011 and stated the area of origin had no reported lightning strikes, the use of motor vehicles in the area was not probable, and the area was not known to be used by recreational campers. The investigation report also documents that camping fires used to keep warm are common in the area of origin due to the volume of illegal border crossers who travel through the region.

National Forest, where target shooters shot rocks and sparks from the bullets ignited dry grass; and the 2007 San Antonio Fire, where a resident accidentally ignited the fire while welding.

- Investigation reports indicate that investigators could not determine a cause or did not document a suspected cause for 17 fires. These wildland fires ranged in size from 1 acre to 5,070 acres.

To obtain additional information on possible causes of wildland fires, we also reviewed fire incident reports for the 1,123 human-caused wildland fires that occurred on federal and tribal land in the region from 2006 through 2010. Fire incident reports are distinct from investigation reports in that they are completed for each wildland fire and contain overall information on the fires' size, location, and general cause, but they are not formal investigations into the fire's origin. In addition to collecting general fire information, these incident reports allow firefighters to include comments regarding their views on the fires' causes—although such comments are not mandatory and firefighters completing the fire incident reports often choose not to include this kind of information. Of the fire incident reports we reviewed, 57 included firefighter comments noting illegal border crossers as a suspected cause of the fire. Most of these (32 of the 57) were for wildland fires that occurred on the Tohono O'odham tribal land. According to a tribal official, illegal border crossers are a significant cause of wildland fires on tribal land and the purpose of the fires is usually to signal for assistance, cook food, or to provide warmth. Appendix III includes additional information about the fire incident reports we reviewed and a map identifying the location of the 57 wildland fires.

Without Comprehensive Fire Investigation Results, Federal Agencies Lack Key Data Needed to Target Their Fire Prevention Efforts

Without complete data on the cause of wildland fires on the lands that they manage, federal agencies are hampered in their ability to target their efforts and resources at preventing future wildland fires. According to interagency guidance, the *Wildfire Origin and Cause Determination Handbook*, identifying trends in fire causes is critical to the success of fire prevention programs, and the results of fire investigations can assist in policy development. Similarly, a Forest Service document states that the first step in the prevention of human-caused wildland fires is to determine the group most likely to start fires. However, in reviewing several agency fire prevention plans for the region, we found that they included only broad wildland fire awareness programs and activities but did not identify specific trends or discuss groups likely to start fires or discuss the possible role of illegal border crossers in contributing to fires in the region. Without either additional data on the ignition source of fires in the Arizona

border region or a systematic process for using the information identified in investigation reports, it will be difficult for the land management agencies to identify more specific wildland fire prevention activities or better target fire prevention efforts and resources.

In contrast, the experience of the Cleveland National Forest in California provides an example of the potential benefits of better targeting fire prevention efforts. In 1996, the Forest Service formed the Border Agency Fire Council in Southern California to help identify activities that could prevent future wildland fires.³⁴ Using data on the cause of wildland fires, the council determined that a number of wildland fires were the result of improperly extinguished campfires left by illegal border crossers. In response, officials from the Cleveland National Forest created a border fire prevention crew that hikes daily on trails known to be used by illegal border crossers and extinguishes abandoned campfires. In 2008 alone, the forest reported that the fire prevention crew extinguished 101 abandoned campfires that, had they not been suppressed, could have grown into larger and more damaging wildland fires. This example demonstrates that with better information about the specific ignition source of human-caused wildland fires, the agencies could be better equipped to take actions that may prevent future wildland fires.

The Presence of Illegal Border Crossers Has Complicated Fire Suppression Activities, and Agencies' Responses May Not Fully Address the Issue

The presence of illegal border crossers has increased the complexity of fire suppression activities in the border region, according to federal agency officials, because it can endanger firefighters' safety, complicate the use of radio communications, and limit the use of certain types of fire suppression activities. Agencies have taken a number of actions to mitigate the threats to firefighters in the Arizona border region, but these actions may not be sufficient to ensure that agency resources are being used most effectively, and none of the agencies has developed a risk-based approach for using resources to support fire suppression activities in the region.

³⁴The Border Agency Fire Council is made up of 43 U.S. and Mexican government agencies and organizations representing fire protection and law enforcement personnel, legislators, emergency responders, natural resource managers, and elected officials that address public safety issues pertaining to wildland fire along the U.S.-Mexico border.

The Presence of Illegal Border Crossers Has Complicated Wildland Fire Suppression Activities in the Arizona Border Region

The presence of illegal border crossers has complicated wildland fire suppression activities in the Arizona border region, according to federal agency officials, largely because of concerns about firefighter safety. In 2006, the Forest Service issued a report stating that the Arizona border region is made more dangerous for firefighters because they may encounter smugglers; high-speed law enforcement pursuits; environments littered with trash and other biological hazards; and illegal border crossers who are seeking food, water, transportation, or rescue.³⁵ While federal agency officials we interviewed, including fire response and law enforcement officials, did not identify any specific incidents in which firefighters had been assaulted or threatened by illegal border crossers, they identified several aspects of illegal cross-border activity that firefighters must account for while suppressing fires in the region.

Firefighters may encounter armed smugglers. Federal agency officials told us that violence could result if firefighters encounter armed smugglers while suppressing fires in remote areas. They did not provide any examples of specific situations in which firefighters had experienced such violent encounters with smugglers; however, officials cited instances in which individuals they believed to be illegal border crossers were encountered during fire suppression activities. The fire investigation report for the recent 2011 Horseshoe Two Fire indicates that drug smugglers continued to use that area even as fire suppression activities were underway.

Illegal border crossers may be injured or killed by suppression activities. A number of fire response officials told us that they believe many illegal border crossers generally try to avoid contact with firefighters in the region—which, while reducing concern for firefighters' safety, raises concerns about the safety of illegal border crossers who could be harmed or killed by fire suppression activities. For example, firefighters sometimes set backfires—the burning of grass, leaves, brush, and other fuels located between an advancing fire and an established control line, such as a road—to halt the spread of wildland fires. Given the concern about the possible presence of illegal border crossers in the Arizona border region, firefighters—or, in some cases, U.S. Border Patrol agents—will, in some instances, first conduct a search of an area to attempt to identify whether

³⁵Lisa Outka-Perkins, Theron Miller, and Jon Driessen; USDA Forest Service and Missoula Technology and Development Center, *Personal Safety of Federal Land-Management Field Employees Working Along the Mexican Border*, 0067-2802-MTDC (2006).

illegal border crossers are in harm's way before igniting a backfire. This additional step can increase the resources and time needed to suppress the fire.³⁶

Firefighters may reduce their use of nighttime firefighting activities. The potential presence of illegal border crossers has caused agencies to reduce their use of nighttime fire suppression activities and temporary overnight camps for firefighters because of the perceived threat to firefighters' safety. As a result, firefighters may have to forgo or delay some firefighting tactics, which in turn may allow fires to grow larger and more damaging. For example, a Forest Service official told us that on the first day of the 2009 Hog Fire, firefighters were unable to set up an overnight camp at the scene of the fire because no law enforcement support was available to provide security. According to this official, this allowed the fire, which had burned 200 to 300 acres at the time, to grow to more than 3,000 acres by the next morning; the fire ultimately burned nearly 17,000 acres and cost more than \$700,000 to suppress.

Illegal cross-border activity may interfere with radio communications. According to agency officials from several land management agencies, communicating by radio is difficult as a result of illegal cross-border activity in the Arizona border region. For example, according to federal agency and tribal officials, illegal border crossers may use the same radio frequencies as firefighters, causing interference and limiting their ability to safely coordinate fire suppression activities. In one instance, a tribal official told us that the Tohono O'odham Nation's sole radio repeater—which allows firefighters to communicate over long distances—had its frequency taken over by illegal border crossers and is now unusable to firefighters.³⁷ The tribal official stated that the lack of access to a repeater limits firefighters' ability to communicate. We were also told by Forest Service officials that firefighters are instructed not to use radios when they encounter illegal border crossers because illegal border crossers may

³⁶According to Border Patrol and federal land management agency officials, Border Patrol agents do not generally participate in wildland fire suppression activities. However, in some situations, they may provide certain types of assistance during these activities, such as providing temporary security for firefighters until federal land management agency law enforcement can arrive.

³⁷Radio repeaters are used to increase the effective communications range of handheld portable radios, mobile radios, and base station radios by retransmitting received radio signals.

believe that firefighters are reporting their location to law enforcement and react violently.

Volume of air traffic increases the importance of interagency coordination. According to federal and tribal officials, aerial fire suppression activities in the Arizona border region require extra caution because of the high volume of other federal air traffic in the area—particularly DHS aircraft conducting border security operations, such as drug interdiction or search and rescue, and DOD aircraft conducting training flights. According to the officials, both fire suppression and DHS aircraft often operate at low altitude and in the same areas along the border, making the risk of a midair collision higher than in other areas across the country. To enhance safety, they emphasize the importance of coordinating with agency dispatch centers to ensure that airspace is clear of other traffic when conducting aerial fire suppression activities.

Firefighters may be distracted by the presence of illegal border crossers. More broadly, officials from several land management agencies told us the potential presence of illegal border crossers is a distraction to firefighters that can result in firefighters focusing more on their own security, or that of illegal border crossers, than on suppressing the fire. In addition, agency officials stated that firefighters have discovered the bodies of illegal border crossers, which further distracts them and affects their morale.

Agencies Have Taken Steps to Mitigate Threats to Firefighters in the Arizona Border Region but Do Not Have a Formal Risk-Based Approach for Using Their Resources

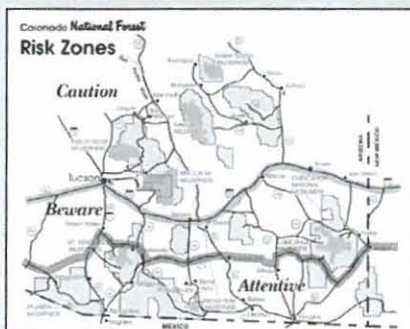
The Forest Service has taken a number of actions to mitigate the threats to firefighters' safety in the Arizona border region—which other agencies have generally followed. In 2008, the Forest Service published an instructional DVD to educate federal, state, local, and tribal employees working along the U.S.-Mexico border on safety concerns and work practices that can reduce on-the-job risks.³⁸ One of the training modules specifically discusses illegal border crossers' effects on fire suppression activities in the region and special precautions that firefighters should take. The Forest Service also produces and distributes "International Border Watchouts" cards to all firefighters conducting suppression activities on the Coronado National Forest. These cards highlight specific

³⁸USDA Forest Service and Missoula Technology and Development Center, *Working Along the United States-Mexico Border*, 0823-2M29-MTDC (2008).

**International Border Watchouts Card
Provided to Firefighters by the Forest
Service**

International Border Watchouts!

1. Expect high speed driving and law enforcement pursuits
2. Expect drivers to be distracted
3. All aircraft operations have increased collision risk
4. Radio frequency interference from Mexico likely
5. Radio/cell phone dead spots increase employee risks
6. Cell phone connections to Mexico likely
7. Language barriers increase risk
8. Threats to employees are present 24/7/365
9. You are not clearly identified as F.S. employee
10. Every visitor contact has potential risk
11. Higher occurrence of unexpected visitor encounters
12. Traditional responses may not be appropriate, check your gut
13. Responding to situations inconsistent with assigned authority and training
14. Night operations require special considerations
15. Unattended vehicles will be damaged or stolen
16. Illegal uses in remote areas likely
17. Heightened risk of biological contamination
18. Always know your location and be able to describe it
19. Let others know your expected route and destination (checkin/check-out)



Source: USDA's Forest Service.

risks that firefighters might face when suppressing fires on the forest and include a map identifying where—based on proximity to the border—they are most likely to encounter these risks.

The Forest Service has also developed a Border Fire Response Protocol, which recommends that firefighters working in the Arizona border region consider taking certain actions to mitigate the potential risks posed by illegal cross-border activity. One of the recommended actions is for fire responders to request that law enforcement support be dispatched to fires in the region to provide security for firefighters and their equipment. Officials from all five federal land management agencies explained that law enforcement provides security in multiple ways, including providing an armed presence while firefighters are suppressing fires or camping overnight, clearing areas of any illegal border crossers that might be hiding in an area where fire suppression activities—such as backfires—are going to occur, and guarding fire suppression vehicles and equipment to prevent theft.

Officials from all of the other federal land management agencies in the region—BIA, BLM, FWS, and NPS—told us they generally follow the Forest Service's fire response protocol informally but that they have neither formally adopted it nor developed their own guidance to account for the impacts that illegal border crossers have on wildland fire suppression activities in the region. A number of federal officials in the border region from these agencies identified the lack of formal protocols for the four Interior land management agencies as a major concern, in part because without formal policies it is unclear that these agencies will provide the most appropriate and consistent fire response actions for the region. Under the *Standards for Internal Control in the Federal Government*, agencies are to employ control activities, which are the policies, procedures, techniques, and mechanisms to ensure effective program management and help ensure that actions are taken to avoid risk.³⁹ In this case, such activities would include protocols for federal land management agencies responding to wildland fires in the region.

More broadly, the land management agencies have recognized risks associated with fighting wildland fires in the Arizona border region, but

³⁹GAO, *Standards for Internal Control in the Federal Government*, GAO/AIMD-00-21.3.1 (Washington, D.C.: November 1999).

none of the agencies use a risk-based approach for allocating law enforcement resources in support of wildland fire suppression activities specific to the region. Instead, law enforcement is dispatched to most wildland fires whether any specific threats have been identified or not. Both federal fire response and law enforcement officials told us that not all fire suppression activities need security because the threat posed to firefighters by illegal border crossers varies by fire. Further, fire response officials told us that waiting for law enforcement to arrive can delay firefighting efforts; similarly, law enforcement officials told us that being dispatched to all fires regardless of the level of safety concerns has hampered their ability to do other high-priority work, such as conducting drug interdiction or fire investigations. We have previously recommended that, when making decisions about needed law enforcement resources and how to distribute those resources, federal land management agencies should adopt a risk management approach to systematically assess and address threats and vulnerabilities.⁴⁰ This recommendation, which the agencies agreed with, noted that, in keeping with the *Standards for Internal Control in the Federal Government*, such an approach should identify risks, assess their magnitude and likelihood of occurrence, and use information from these assessments in determining the law enforcement resources needed and the best way to distribute those resources. However, such an approach has not been developed or implemented for the Arizona border region. Without a systematic risk-based approach that incorporates a consideration of the threats associated with individual fires, the agencies lack assurance that they are using their limited law enforcement resources in the most efficient manner.

Conclusions

Federal land management agencies in the Arizona border region face a set of complex and diverse challenges in carrying out their responsibilities, including those posed by illegal border crossers and wildland fires. In general, the agencies are well aware of the threats associated with wildland fire suppression activities in the border region and have taken some steps to address them, such as following the Forest Service's Border Fire Response Protocol. However, gaps in information and inefficient deployment of limited law enforcement resources create operational challenges limiting the agencies' ability to fully address the complications they face. The agencies do not have in-depth information

⁴⁰GAO-11-144.

about the specific ignition sources of human-caused wildland fires in part because they have not conducted investigations for all human-caused fires—often because of limited resources—as called for by interagency policy. In a time of constrained resources and competing needs, we recognize that investigating all human-caused wildland fires in the Arizona border region may not be feasible. However, the agencies have not developed a strategy for determining which fires to investigate, including specific criteria to help identify and prioritize those fire incidents that should be investigated. Further, agencies do not have a systematic process for using the information identified in the investigations to inform decisions on prevention efforts. Without this information, it will be difficult for agency efforts to target fire prevention activities and resources and potentially reduce the incidence of human-caused wildland fires in the region. Further, the practice of dispatching law enforcement support to most fires, rather than considering the risk or safety concerns associated with individual fires, may delay fire suppression activities and prevent law enforcement from conducting other high-priority work, such as drug interdictions or fire investigations. Without a systematic risk-based approach that incorporates a consideration of the risks associated with individual fires, the agencies lack assurance that they are using their limited law enforcement resources in the most efficient manner. Finally, the Interior agencies have taken an important step by informally following the Border Fire Response Protocol developed by the Forest Service, but without formally adopting the protocol or developing corresponding protocols of their own, they lessen the chances that the procedures in the protocol will be consistently followed.

Recommendations for Executive Action

We recommend that the following five actions be taken:

- To ensure agencies have the data needed to identify wildland fire prevention activities and to ensure resources are effectively targeted, the Secretaries of Agriculture and the Interior should direct the Chief of the Forest Service, the Directors of the Bureau of Land Management, Fish and Wildlife Service, and National Park Service, and the Assistant Secretary for Indian Affairs to take the following actions: (1) re-examine the policy that all human-caused wildland fires be investigated; (2) once the agencies have determined the appropriate level of investigations, develop a strategy for determining which fires to investigate, including specific criteria to help select and prioritize those fire incidents that should be investigated; and (3) develop a systematic process to use the information identified in the investigations to better target fire prevention activities and resources.

- To ensure that fire suppression activities are not unnecessarily delayed and that law enforcement resources are efficiently allocated, the Secretaries of Agriculture and the Interior should direct the Chief of the Forest Service and the Directors of the Bureau of Land Management, Fish and Wildlife Service, and National Park Service to develop a coordinated risk-based approach for the region to determine when law enforcement support is warranted for each wildland fire occurrence and adjust their response procedures accordingly. In developing this approach, officials in the region should consult with agencies' headquarters to ensure consistency in the approaches being developed for the region and for all land management agency units nationwide.
- The Secretary of the Interior should direct the Directors of the Bureau of Land Management, Fish and Wildlife Service, and National Park Service, and the Assistant Secretary for Indian Affairs to develop border-specific fire response guidance or review existing guidance to determine whether it is sufficient and, if so, formally adopt it.

Agency Comments and Our Evaluation

We provided the Departments of Agriculture, Defense, Homeland Security, and the Interior with a draft of this report for their review and comment.

In its written comments, the Forest Service, responding on behalf of the Department of Agriculture, agreed with our observations and the two recommendations addressed to the agency. The Forest Service's comments are reproduced in appendix IV.

The Department of the Interior did not provide written comments to include in our report. However, in an e-mail received October 24, 2011, the agency liaison stated that Interior generally concurred with our recommendations and that implementing the recommendations will require consultation with the Department of Agriculture to ensure interagency consistency. Regarding our second recommendation, Interior noted that it disagrees that there is a lack of coordinated risk-based law enforcement support, but concurred that improvements and adjustments can be made. While we are encouraged that Interior acknowledges improvements can be made, based on our observations we continue to believe that the agency does not use a systematic risk-based approach that incorporates a consideration of the risks associated with individual fires when allocating law enforcement resources. Interior also noted that it agrees that coordination and consultation within the region and across the

nation for both responses with wildland fire and law enforcement in a refined risk-based approach can ensure that appropriate fire suppression responses are implemented. Interior also provided technical comments in its e-mail response, which we have incorporated as appropriate.

In its written comments, the Department of Homeland Security agreed with our observations about the complex and diverse challenges that federal land management agencies face in the Arizona border region. The department's comments are reproduced in appendix V.

The Department of Defense did not provide written or technical comments in response to our report.

As agreed with your offices, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the report date. At that time, we will send copies to the Secretaries of Agriculture, Defense, Homeland Security, and the Interior; the Chief of the Forest Service; the Assistant Secretary for Indian Affairs; the Directors of the Bureau of Land Management, Fish and Wildlife Service, and National Park Service; appropriate congressional committees; and other interested parties. In addition, the report will be available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staffs have questions about this report, please contact me at (202) 512-3841 or mittala@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. Key contributors to this report are listed in appendix VI.



Anu K. Mittal
Director, Natural Resources and Environment

List of Requesters

The Honorable Lisa Murkowski
Ranking Member
Committee on Energy
and Natural Resources
United States Senate

The Honorable John Barrasso
Ranking Member
Subcommittee on Public Lands
and Forests
Committee on Energy and
Natural Resources
United States Senate

The Honorable John McCain
United States Senate

The Honorable Jon Kyl
United States Senate

Appendix I: Scope and Methodology

The objectives of our review were to determine (1) the number, cause, size, and location of wildland fires in Arizona that occurred within 100 miles of the U.S.-Mexico border from 2006 through 2010; (2) economic and environmental effects of significant human-caused wildland fires (i.e., those fires that burned 10 or more acres); (3) the extent to which federal agencies determined that illegal border crossers were the ignition source of fires on federal lands; and (4) ways, if any, in which the presence of illegal border crossers has affected fire suppression activities in the Arizona border region.

To determine the extent of wildland fire occurrence in the Arizona border region, we collected federal and state fire occurrence data from databases at the National Interagency Fire Center (NIFC)¹ for fires that occurred within Arizona during calendar years 2006 through 2010.² We obtained data for the Forest Service through its Fire Statistics System, extracting data from this system for all fires that occurred within the Coronado National Forest. We obtained data for the Department of the Interior's Bureau of Indian Affairs (BIA), Bureau of Land Management (BLM), and National Park Service (NPS) through its Wildland Fire Management Information Database, extracting data for all fires that occurred on Interior land units in Arizona. We obtained data for the Department of the Interior's Fish and Wildlife Service (FWS) through its Fire Management Information System, extracting data for all fires on the agency's land units within the Arizona border region. Lastly, we obtained data for lands managed by the state of Arizona, local governments, and private residents through the Fire and Aviation Management Data Warehouse, extracting data for all fires in the state of Arizona. From these data, we geographically located each fire based on latitude and longitude coordinates using geographic mapping software. We filtered the data to

¹NIFC, located in Boise, Idaho, is the nation's logistical support center for controlling and extinguishing wildland fires and coordinates the mobilization of fire suppression supplies, equipment, and personnel at the federal, regional, and local levels. Additionally, NIFC maintains historical fire occurrence data for the Department of Agriculture's Forest Service and the Department of the Interior's Bureau of Indian Affairs, Bureau of Land Management, Fish and Wildlife Service, and National Park Service. NIFC also maintains historical fire occurrence data collected by state agencies, including the Arizona State Forestry Division, for fires on nonfederal lands.

²We did not include fires that occurred in calendar year 2011 because federal agencies do not collect fire documentation from local units or conduct quality assurance checks on data until the end of the calendar year, and, therefore, 2011 data are not yet complete and may not be reliable.

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include only fires that occurred in Arizona within 100 miles of the U.S.-Mexico border. A number of records in the data set did not include geographic coordinates, preventing us from verifying the location of the fires—and, as a result, these fires are not included in our analysis. For the fires we were able to verify as within the Arizona border region, we then analyzed the data to identify the acreage burned and general cause—human or natural—cited for ignition. We assessed the reliability of the data we used by reviewing information about the underlying database systems and discussing the data with agency officials responsible for managing these databases, and determined that the data were sufficiently reliable for the purposes of presenting acreage burned and general cause of fires occurring during calendar years 2006 through 2010. Because NIFC does not manage the Department of Defense's (DOD) fire occurrence data, we also obtained information from DOD regarding wildland fire occurrence on its lands in the region and included these data in our overall figures. DOD officials identified and provided data for those fires on DOD-managed lands located within the Arizona border region. In our assessment of the data, we determined that these data were not sufficiently reliable for our purposes of presenting a comprehensive account of fires and acreage burned on DOD lands during calendar years 2006 through 2010. However, we included the information we were provided because they were the only data available.

During the course of our review, in 2011, two significant fires occurred in the Arizona border region—the Horseshoe Two and Monument fires. We could not include information on these two fires in our data analysis because at the time of our review, the data from the federal agencies on these fires were not complete and could not be determined as reliable. However, given the significance of these fires, we have included some descriptive and preliminary information about them throughout the report, as appropriate.

To determine the economic and environmental effects of significant human-caused wildland fires, we first identified those human-caused fires that burned 10 or more acres (which we consider significant fires for the purposes of this report) using the data collected in the previous objective. We then obtained additional information on these fires from the federal and state land management agencies included in our review. Each agency provided us with the amount of funds obligated to suppress the fires. Because some funding obligations for individual fires occurred over multiple years, we did not adjust these figures for inflation. In addition, the federal land management agencies provided us with data on environmental assessments conducted in response to these fires, as well

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as data on environmental restoration funds requested or provided in response to significant human-caused wildland fires. (The state of Arizona does not conduct such assessments or provide such funds.) We also identified the grazing allotments on Forest Service lands that were within the Arizona border region and could have been affected by human-caused wildland fires. For these allotments, we requested data from Forest Service's range management officials for any damages and repairs to these lands as a result of significant human-caused wildland fires. In addition, we reviewed studies conducted by academicians and wildland fire organizations on the economic impact of wildland fires.³ Our review of the economic impact studies was not comprehensive to include all studies that may exist. Finally, we visited the region and discussed with federal, tribal, and state officials, as well as private industry representatives and private citizens in the ranching community, the economic and environmental damage that has occurred as a result of human-caused wildland fires.

To determine the extent to which federal agencies determined that illegal border crossers were the ignition source of wildland fires on federal lands, we reviewed agency documents to identify criteria for conducting investigations into the ignition source of human-caused wildland fires. We then identified all human-caused wildland fires and requested fire investigation reports for each fire from Forest Service and the Interior agencies. Because of extensive resource commitments on the part of the agencies in response to the severe 2011 wildland fire season in Arizona and the amount of resources needed to provide us with investigation reports, we limited our request to investigation reports for human-caused wildland fires burning at least 1 acre, which cumulatively comprised more than 99 percent of the acreage burned by human-caused wildland fires in the region from 2006 through 2010. We reviewed and evaluated the fire investigation reports to determine the extent to which fire investigations were conducted for human-caused wildland fires, and, for those fires for which investigations were conducted, we identified the extent to which officials identified illegal border crossers as the source of ignition. Additionally, we reviewed fire incident reports created by fire response

³Western Forestry Leadership Coalition, *The True Cost of Wildfire in the Western U.S.* (April 2010). Dennis L. Lynch, *Journal of Forestry*, "What Do Forest Fires Really Cost?" (September 2004). Bob Zybach, Michael Dubrasich, Greg Brenner, John Marker, Wildland Fire Lessons Learned Center, *U.S. Wildfire Cost-Plus-Loss Economics Project: The "One Pager" Checklist* (fall 2009).

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personnel for all human-caused wildland fires to identify the extent to which they cited illegal border crossers as a potential source of ignition.

To determine ways in which the presence of illegal border crossers have affected fire response activities in the Arizona border region, we reviewed national and regional land management wildland fire guidance to identify any practices unique to regional land management units developed in response to illegal cross-border activity. We also identified and reviewed training materials and other documentation, such as the Forest Service's *Working Along the United States-Mexico Border* DVD and the Coronado National Forest's *Border Fire Response Protocol*, and interviewed land management, firefighting, and law enforcement officials to further identify specific actions taken in the border region. Further, during our site visits, we discussed with federal and nonfederal officials their experiences fighting wildland fires in the region.

We conducted this performance audit from December 2010 to November 2011 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.